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ABSTRACT

Intended for students aged 11 to 13 years, this is the true story of an Antarctic exploration as told by one of the participants. In 1956, he and two companions, along with a team of huskies started from the Australian base at Mawson, Antarctica and journeyed across the sea ice to locate the Douglas Islands and fix them on the map. The story tells the reader much about life in Antarctica. Children learn about the love the dog handler has for his huskies, which are still used in Antarctica. Readers gain a glimpse of the difficulties the explorers encountered as they battled the elements from tide cracks to blinding blizzards. Youngsters learn of the hardships of traveling, cooking, sleeping, and carrying on scientific work in the harsh Antarctic environment. Numerous photographs appear throughout the story. A glossary is included, as is a list of other materials about Antarctica for students. (DB)

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The Author

Nils Lied was born and educated in Norway. After taking courses in radio and navigation in Oslo he went to sea at eighteen years of age. He served in the Merchant Navy and in the Royal Norwegian Navy.

The first serious test of his skill as a navigator came during the Second World War when he was serving on a tanker which was torpedoed in the North Atlantic. He sailed a lifeboat 380 nautical miles to Reykjavik (Iceland), making a perfect landfall. This was all the more creditable because he had a wrist-watch for a chronometer, half a pencil and a roll of paper that was never intended for navigation calculations. Later, he was given command of a corvette.

Nils came to Australia in 1948 and served in the Antarctic Division of the Department of Science on four wintering expeditions - Heard Island in 1951, Mawson 1956, Davis 1957 and 1961. He also participated in summer expeditions to Macquarie Island in 1955, Heard Island in 1963 and Enderby Land in 1964-65. He was always in charge of dog teams and has sledged 8500 kilometres - give or take a metre or two! He was a member of the party of three which was the first to circumnavigate Heard Island on foot. His name appears on a number of geographic features of the map of Antarctica - Mt Lied, Lied Bluff, Lied Glacier, Lied Island, Lied Lake and Mt Nils. He now lives at Adventure Bay, Bruny Island, Tasmania.

Nils has received both Norwegian and British decorations. He holds the Polar Medal and Bar.

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Castles of Ice

Nils Lied

Curriculum Development Centre Canberra Australia

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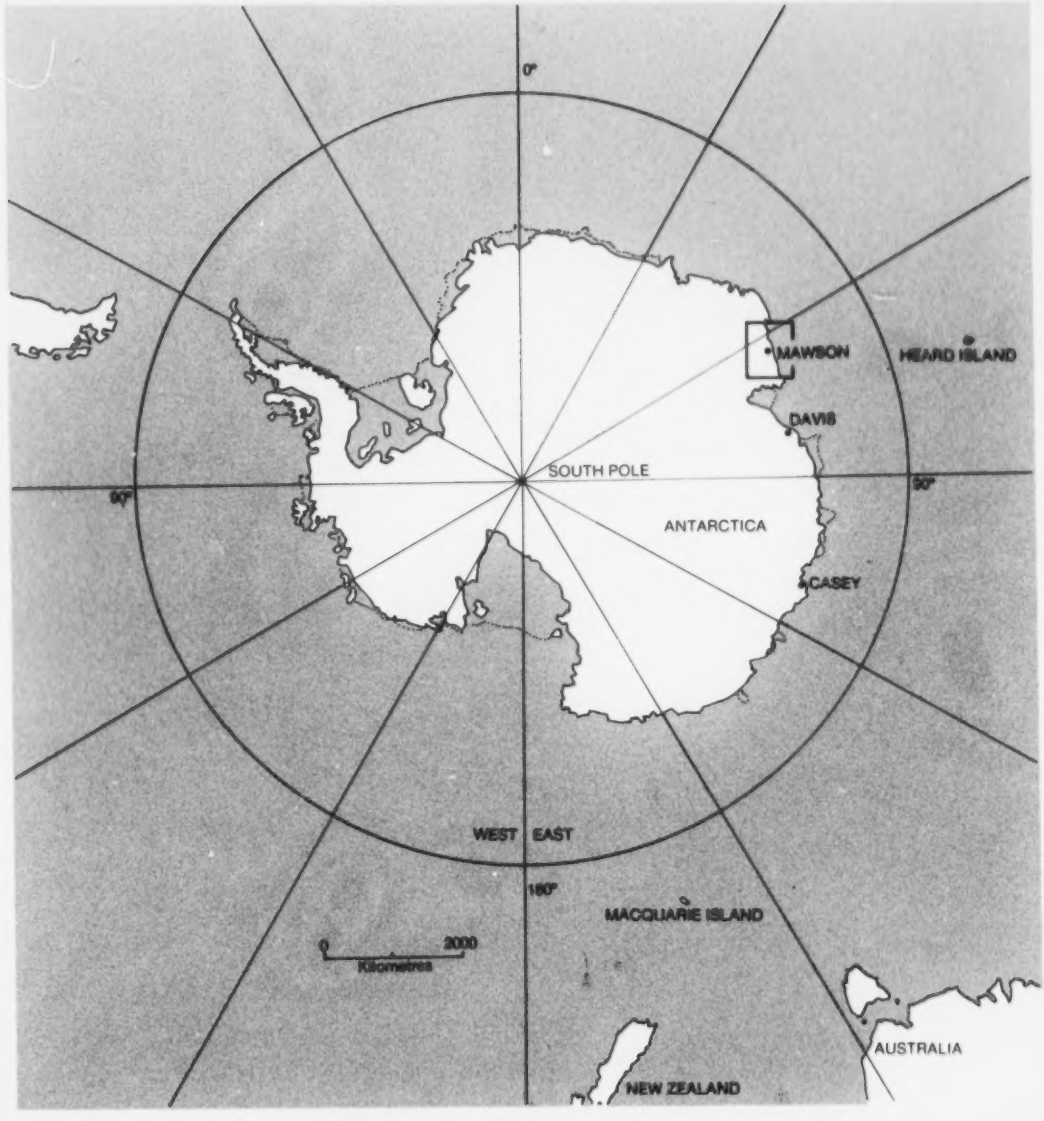
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AUSTRALIA
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Introduction

Castles of Ice is a true story of Antarctic exploration. It is an account of a sledge trip undertaken by the author, with two companions, in the late nineteen-fifties. Starting from the Australian base at Mawson, they had to cross the sea ice to locate the Douglas Islands and fix them on the map.

The story tells us much about life in Antarctica. We learn of the love of the dog handler for his huskies, which are still used in Antarctica, even in these days of motor toboggans and helicopters. (You can learn more of one of the huskies in another story in this series, **Oscar**). We gain a glimpse of the difficulties the explorers encountered as they battled with the elements from tide cracks to blinding blizzards. We learn of the hardships of travelling, cooking, sleeping and carrying out scientific work in the harsh Antarctic environment.

The beauty of the frozen land is also described — the ice castle in the story is a marvel of natural sculpture. But perhaps the strongest impression we are left with is the unfailing courage and humour of those who spent time living and working "on the ice".

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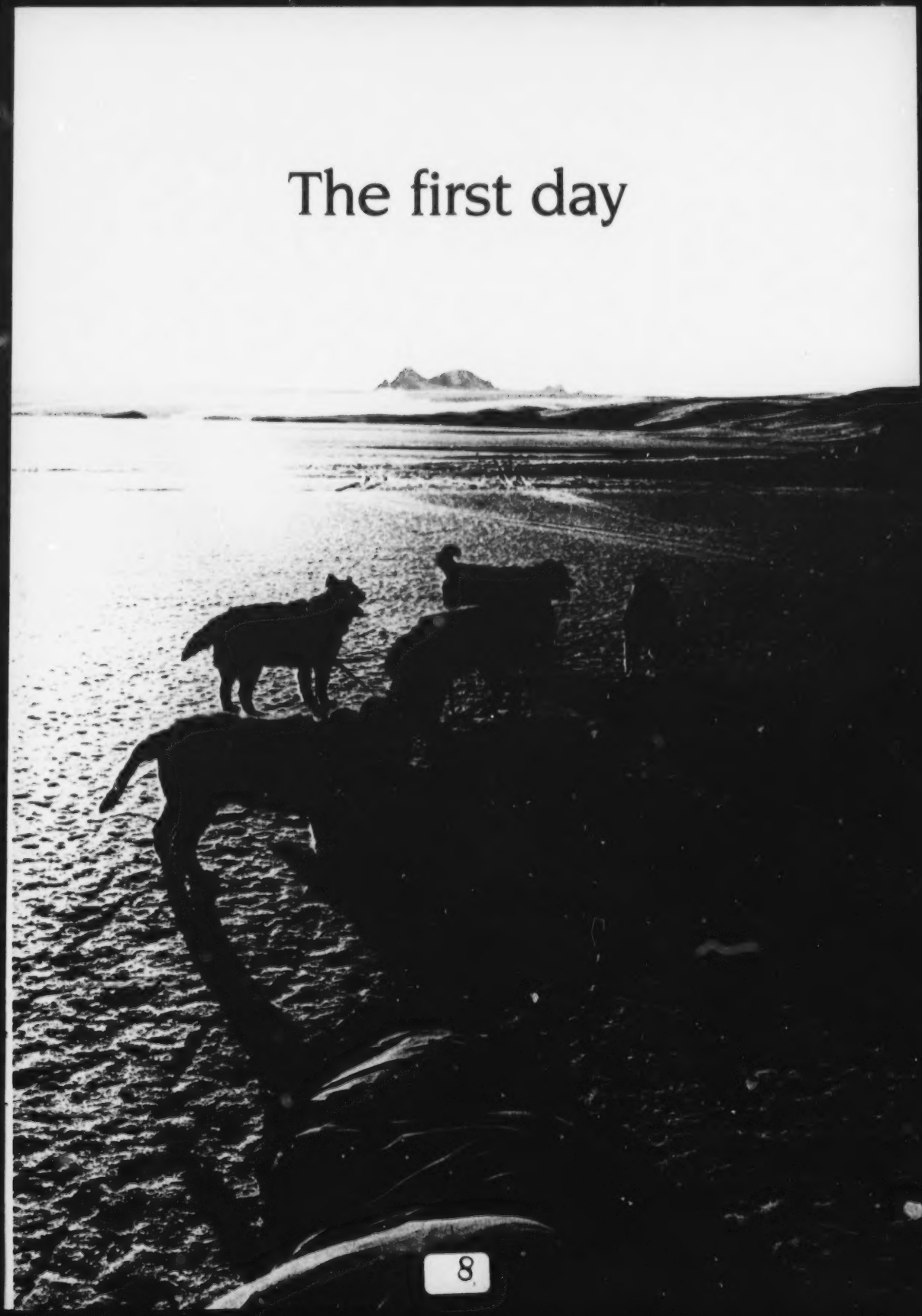
Sea ice

Huskies taking
a breather

The first day



In 1929, the explorers Campbell and Douglas sighted two islands while making a flight from Sir Douglas Mawson's ship, the **Discovery**. When we were at Mawson, we had the task of relocating the Douglas Islands.

To reach them, we had to drive about 48 kilometres north-east over the frozen sea from the coast at Mawson. It was half-way through July, in the depths of mid-winter, so it was still dark when we put the harnesses on the dogs. A bleak wind whistled off the plateau and out over the sea ice. It was 23.3° C below freezing.

We held on tight to the sledge as we drove out of the harbour. The dogs were fresh and eager in the early morning, but the heavy load would soon settle them down. In less than an hour we had cleared all the local islands and started to cross the frozen sea towards the next group of coastal islands to the east.

Run - ride. Run - ride. We heard the quiet "sssheee" of the sledge runners and the panting of the dogs. The clouds of frost from our breath looked like smoke.

Low, swirling drift-snow gradually coated one side of the sledge. As we travelled further out to the sea, the wind dropped The next group of islands loomed up ahead among the icebergs which were frozen into the sea. We started looking for a camping site. It's best not to camp on the open sea ice. Sometimes, especially during a blizzard, the sea ice breaks up, and great chunks of it float away.

"Look," cried Peter. "There's a good camp site just ahead in that little bay."

"Yes, but we'll never pull this load up that steep slope," said Syd.

"Gentlemen," I said "who wants to bet? Maybe you'd be willing to wager half your chocolate ration tonight or perhaps a dry pair of socks towards the end of this trip."

"You're on," grinned Syd, after a second look at the slope.

"I'm not betting," said Peter. "You probably have a trick up your sleeve. It looks impossible to me but I've seen what you can do with those dogs."

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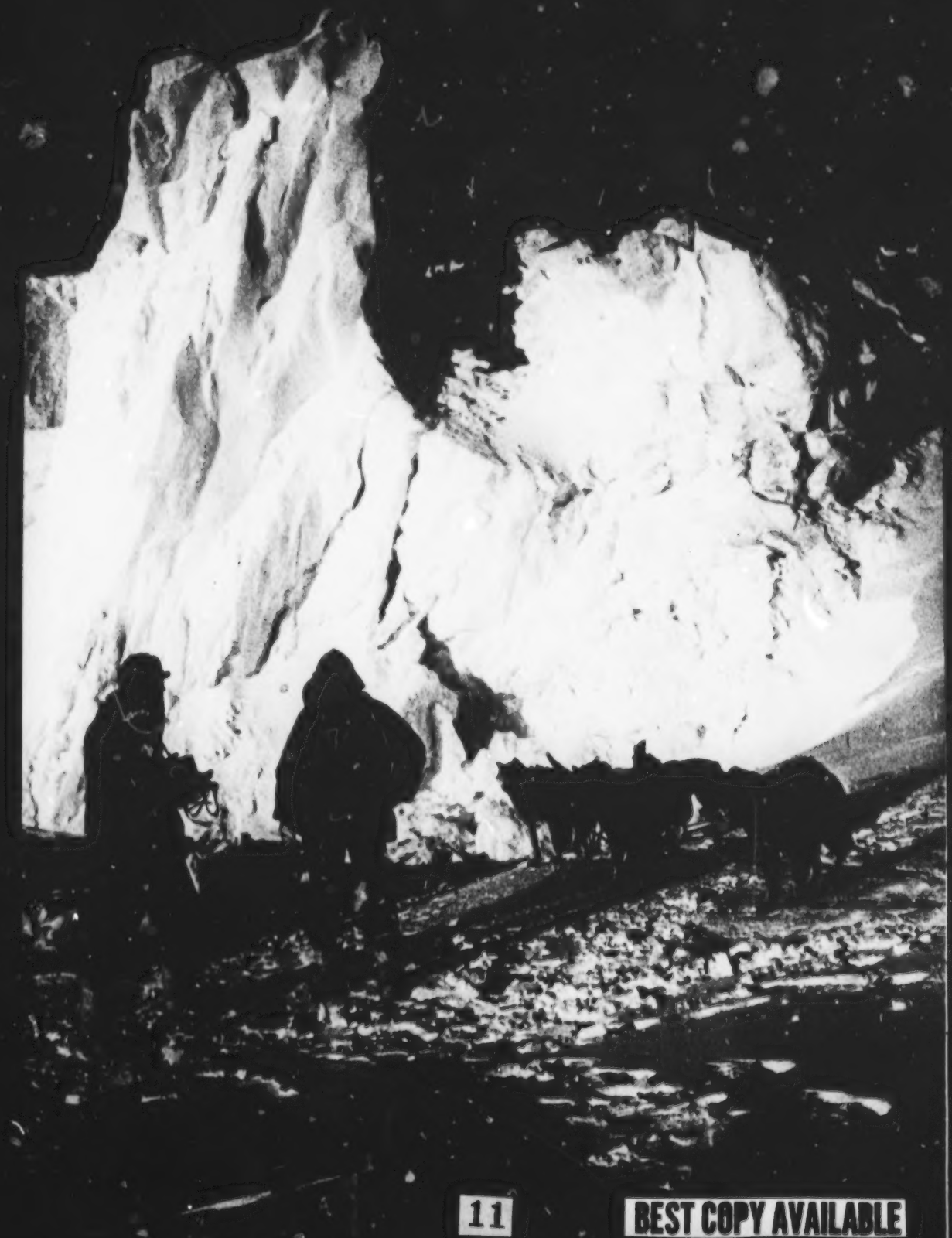

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The slope did look hard to climb, but on the top was a perfect flat place to pitch the tent and tie up the dogs. To get there, we had to get our dogs and sledge across a tide crack. Then we had to make our way up a very steep, slippery part covered with ice blocks, ice floes and rocky outcrops.

First I tried to drive the team straight up. No good. Obviously the dogs felt this was too much after their run.

"I'm going to enjoy that chocolate," said Syd.

"Just steady the sledge, boys, and hang on," I replied.

I felt a bit mean as I went to the front, untied Danny, the lead female dog, and led her to the top of the slope. There I played with her in full view of the jealous dogs below. Then I reached for the pemmican I had sneaked into my pocket. When they saw her tuck in to the dried meat cakes, the eager huskies howled and pulled at their harnesses. They jerked the heavy sledge and pulled the load up the slope without a pause. Peter and Syd were left at the bottom, looking up in amazement. Then they burst out laughing.

"Only an old villain like you could have thought of that," laughed Syd.

"There's nothing new about the trick," I explained. "The Eskimos have been doing that sort of thing for thousands of years."

Soon afterwards the tent was put up and a pot of "hoosh" was bubbling on the camp stove. The dogs had already received their ration of special dog pemmican. We relaxed on our sleeping bags and listened to the gentle, creaking noise of the ice as it rose and fell with the sea.

"Gentlemen," I said,
"who wants to bet?"

Winter snow ramp

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Among the icebergs

The next day we spent in search of the Douglas Islands. Somewhere to the north, out on the frozen sea, there were two lonely specks of rock hiding among the icebergs. Syd checked his maps and told us where he thought the islands were. While Syd and I prepared to break camp, Peter, a geologist, went off in search of rocks. We moved the heavy sledge down the sea ice, then harnessed the excited dogs and drove off at a fast pace.

In lovely, calm weather, we drove north. It was fairly cold, 20° C below freezing, but we hardly felt it because there was almost no wind. Taking the the lead was Danny with the brothers Butch and Mac behind her. Next came Oscar, running with his old mate Streaky, while Horace and Brownie brought up the rear.

In every dog team there seem to be certain types of dog. There are the alert, bright ones, the bullies, the lazy, cunning ones and those who seem to have no sense at all.

Harnessed and ready to go

Brownie was one of this last kind. If at all possible, Brownie would tangle his traces, even on a straight run. If there was a crack in the ice, he would be the one to fall in. If we sledged on blue, slippery ice, Brownie's legs would fly out in all directions and he would come crashing down, usually finishing up under the sledge. Other dogs had no trouble stealing his food. All the same, we were all rather fond of the old duffer and he would greet everyone with a stupid grin on his face.

Streaky was the bully, always the one to start fights. He had seen many battles, was blind in one eye and one of his ears was half bitten off. In harness he was a good, strong and steady worker.

Horace was the lazy, cunning one who always seemed to be working hard but a slight tug at his trace would show that he was letting the others do all the work. A smart rap across his rump would make him yelp as if in great pain and he would give you a very offended look. He always seemed to get enough food, even when rations were short and was big, healthy and well fed. He was a handsome dog with a head like a lion.

Of Butch and Mac, Butch was the lovable, hard-working, affectionate clown. Both he and Mac, his powerful leader, bore the scars of many battles. The other dogs all accepted their position.

Only once had Oscar contested their leadership, by fighting with Butch. He had almost won the battle when Mac got loose and attacked Oscar from the opposite side. The two leaders gave Oscar the lesson of his life and he never forgot it. He knew he could possibly beat either one in a fight, but not the two together. So Oscar had an occasional practice fight with the rest of the team while he waited on the sidelines. By now Oscar had grown to a great size. He measured 96 centimetres around the chest and

The sea ice became jumbled and broken

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weighed nearly fifty kilograms. His paws were nearly the size of my hands and he carried no spare fat. He was ready to take over the leadership when the time came.

My thoughts about the dogs were interrupted by Peter, who said "Look up there to the right. There must be hundreds of icebergs there."

A couple of kilometres ahead we could see what looked like a city of ice. Blocks of flats, churches with spires and domes, cottages and long low factory buildings were formed by the massive icebergs. Most beautiful of all, there were castles of ice with towers, gates and buttresses. Some had moved recently with tides and currents. Wide frozen channels crossed our course.

"No wonder the other expedition couldn't find the islands among all this ice," said Syd. "You'd have to get right in among all that stuff to have a proper search. Anyway, the position of the Douglas Islands is much further out than this."

As we ran alongside the sledge for warmth, we kept our eyes open. Suddenly I thought I saw something dark, way in among the icebergs. We stopped the team and Syd climbed on top of the load to get a better view.

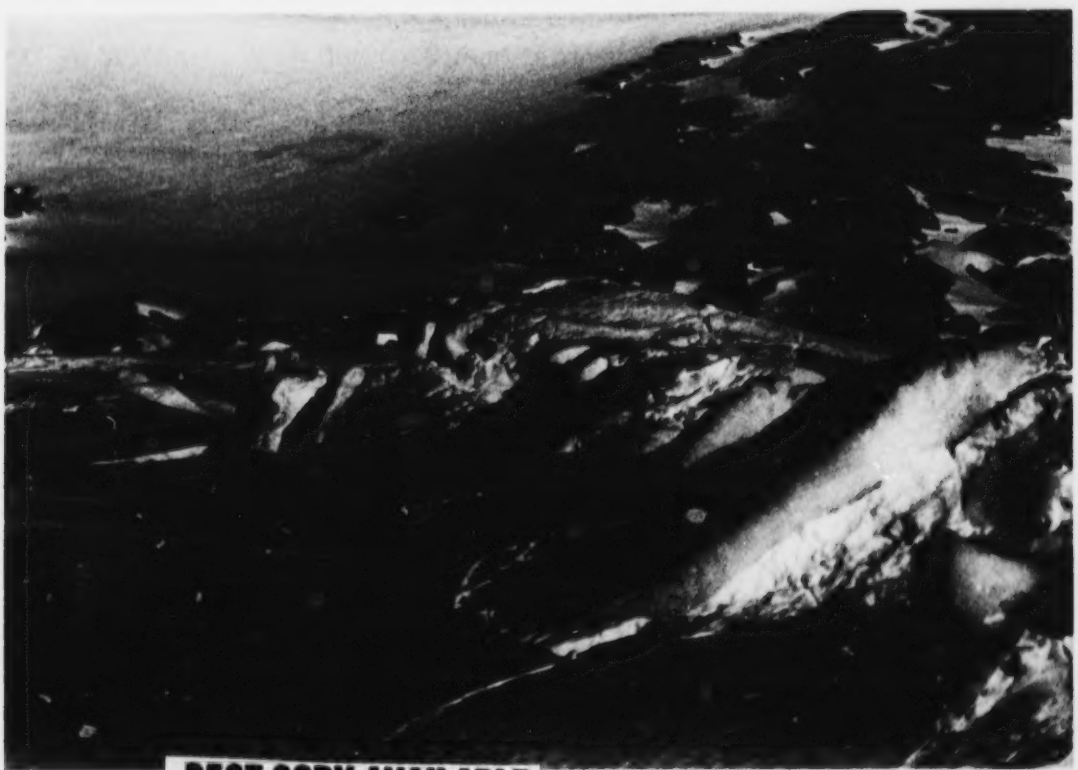
Suddenly I thought
I saw something dark...

"Looks like rock," he said as he gazed through his binoculars. "It could be boulders carried from a glacier in one of the icebergs or perhaps it's some black ice. Anyway, it's still more than six kilometres from the Douglas Islands position. We'll have to drive on. If we miss the islands, we can have a good look among these icebergs on the return trip."

We drove on. By now we were far from the coast, still heading north-east. Syd looked at his map and compass more often now. We kept a sharp look-out and one of us always rode on the sledge, sweeping round with the binoculars.

The sea ice became jumbled and broken. During the autumn and winter, there must have been several major breakouts of ice. When it froze over again, the ice floes had cemented together. Some big icebergs had sailed through like battleships, leaving crushed floes behind them. Several of the cracks had water in them. We crossed some tidal hinges, where the ice that was connected to the land rose and fell with the tide.

Rock and ice



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Nobody said anything about these surroundings but we were probably all thinking about the dangers. Brownie took our minds off them by making us laugh every time he managed to fall into a crack.

"Stop!" cried Syd. "This is it. We should now be standing on top of the Douglas Islands."

We looked around. No sight of islands, just ice, ice and more ice. Syd suggested that we take a look around some nearby icebergs in the two remaining hours of daylight.

At a crack of the whip, the team turned in a wide circle and started to run back in our old tracks. The wind from the coast had died down and the temperature was falling quickly. We watched each other's faces for the white spots which are the sign of frostbite beginning. From time to time one of us had to hold a bare hand against a nose or cheekbone to get the circulation going again.

"This is where we turn left," said Peter. "Here are the marks of our last stop." We swung the team round and soon after, Peter called out "Hey, look at the dogs! They are on to something."

A wind scour: fantastic forms carved in the ice by wind

The islands at last

A husky rests after a hard day's work

We had reached the mass of icebergs and, for some reason of their own, the dogs were running at full speed, whining eagerly at something we could not see.

"It's a seal, a seal-hole or land," I declared. "They only behave like this if they think a run is nearly over and they'll be fed or if they smell a seal."

"Well, look at that!" called Syd. "Those are the islands we're looking for." He pointed ahead as we came out from behind a large iceberg. There, right in front of us, were two small, snow-covered islands hemmed in by the castles of ice.

Seal holes: a Weddell seal slips below the sea ice

We chose the larger island for our campsite, crossing the tide crack and the steep slope. This time we expected to stay in the same camp for a couple of days so we took extra care to make it as comfortable as possible.

After feeding the dogs, we put up the tent and I looked in the ration box for something a bit more exciting to eat than pemmican. The problem about cooking in these temperatures is that water takes a long time to boil. For dinner, we usually added to the breakfast leftovers. Nothing was ever wasted and everything was shared. At the end of a meal we just put the pot outside for a

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In camp

few minutes. We soon had a solid block of pre-cooked, frozen food ready to use for the next meal.

I found a tin of Trim, which is made of different kinds of meat, and cut it into cubes. I tossed in some Marmite and onion powder and my companions ate it without a word of complaint. Hot, black coffee and sledge biscuits followed.

Syd solved the problem of sweets by giving us some honey. This was rather hard to do since the honey had frozen solid in the tin. Syd had the bright idea of using Peter's geological hammer and my knife to break it into pieces. The tin soon looked battered, but we each had a big lump of frozen honey. It was like eating an all-day sucker.

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After the meal, we prepared for the night's star-shots. By taking bearings of several widely-spaced stars, Syd could pin-point our position to within a few metres. Peter was to be time-keeper, noting the exact time as each star appeared, using a very accurate clock called a chronometer. At measured distances from Syd's instruments, we drove marker pegs into the ice. I provided some light for Syd.

By now it was too cold to use our battery-operated lamps. As soon as the light was switched on, the batteries "died of cold". Fortunately, the wind had dropped so we were able to use candles for Syd to line up his sights.

By midnight, our job was done. We had a last cup of tea and climbed into our sleeping bags. Syd twitched and tossed in his sleep as life returned to his cold hands and feet. After a short read, Peter put away his glasses and went to sleep.

"Gosh, it's cold," groaned Syd as he woke up the next morning. "Nils," he added, "you'll be delighted to know that it's your turn to cook breakfast. I'd like a cup of hot coffee in bed first, thank you."

"Just turn over on your back, mate, so I can use you to cook on," I replied. Syd had been sleeping in the middle, which is the warmest spot in the tent, but the one in the middle usually had to serve as table for the cook, holding up the wooden lids where we put the stove, billy-can and cooking pot. Syd shuddered as the icy flakes drifted down from the top of the tent, landing on his bare head and neck.

Peter wisely stayed covered in his sleeping bag. He knew all the tricks. This was his second winter in a row in Antarctica.

"It's your turn to cook breakfast." In Antarctic temperatures water takes a long time to boil

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I got dressed and went outside to do the 8am weather observations. I took careful note of the temperature, wind direction and force, looked for drifting snow and checked visibility and cloud patterns.

The dogs rose and shook themselves as I crawled out of the tent. Some of them were lifting their paws off the ice as if they

were marching on the spot. When I checked the temperatures, I realised why. During the night, the air temperature had dropped to more than 33° C below freezing. The temperature on the ice would have been even lower.

I grabbed a large block of ice. Back in the tent, I smiled happily at my two companions. "Lovely day outside, gentlemen. Birds singing in the trees, not a cloud in the sky. The baker and milkman have been and a parking attendant has just put a sticker on our sledge."

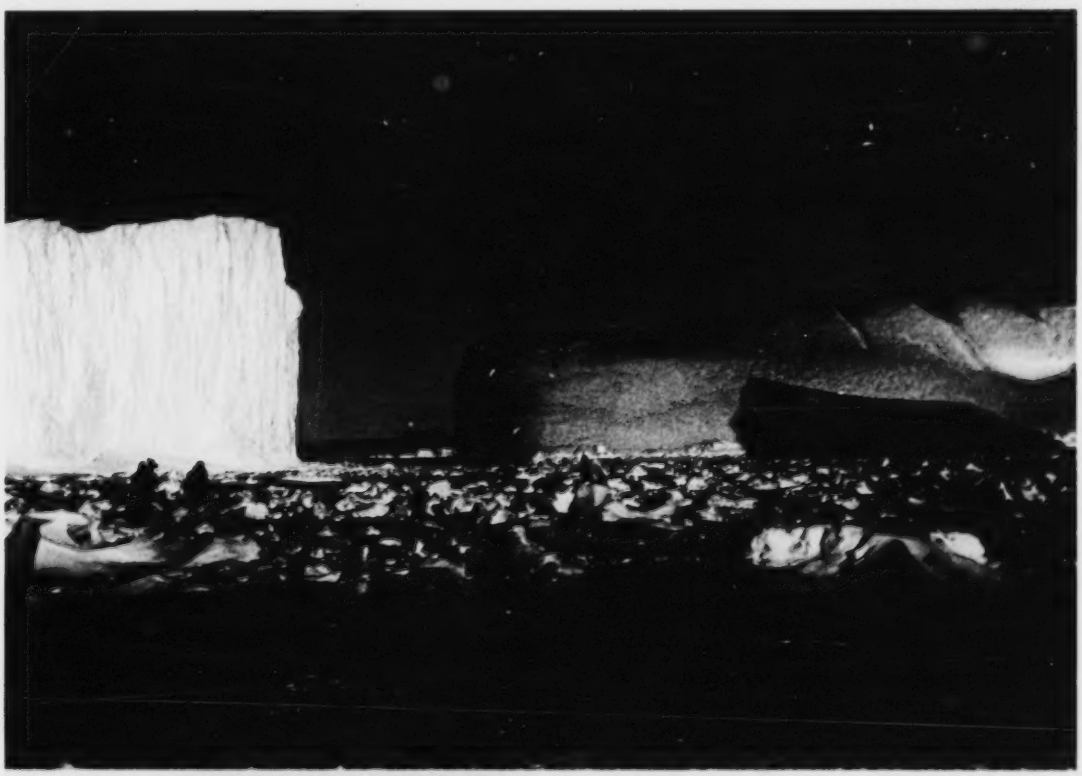
"Don't be so horribly cheerful," said Syd. "What was the temperature?"

"Thirty-three below," I told him.

"It could be worse," said Peter. "We're lucky there's no wind."

Soon the large lump of ice I'd brought back was made into steaming hot coffee and Syd had his wish to have a cup of coffee in bed.

At work on the ice



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Huskies at rest

We spent the day driving south to another group of islands, where Peter scrambled across the ice collecting rocks and testing them. Then we returned to our camp on the Douglas Islands with plenty of daylight to spare and completed the survey of the two small islands.

The weather had been good during the day, but it looked like there was a change ahead. We planned to start back the next day so everything was stowed into the sledge boxes, except what we would need that night.

We spent the day driving south

By 8 o'clock the next morning the temperature had risen to 22° C below. There was a low snowdrift in the west. We broke camp as soon as possible.

"I have a horrible feeling that we're going to be hit by bad weather," I said as we rode the sledge out.

"Whatever happens, we must reach the next group of islands," said Peter. "Last year there were several major breakouts around here and I certainly don't want to head back to Australia on an ice floe."

"The Spjotøy Islands are about 20 kilometres south-west," said Syd. "They're the first pieces of solid rock we come to after the Douglas Islands. There's no shelter at all until we get there."

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Travelling in a blizzard

Bent into the wind

We started our drive. We were racing against time and against the blizzard that was on its way from the plateau. Only one man rode on the sledge while the other two ran alongside. "Look," said Syd, "the coast is disappearing in the drift. All I can see is the top of Welch Island."

"If we steer for those mountain tops, we should run right into the Spjotøy Islands, even if we don't see them till we're on solid rock," said Syd. He took some compass bearings in case we lost sight of the mountains. Then we were off again.

The wind was much stronger and soon the snow started to come at us across the ice. At first it was only waist-high, but this worried the dogs. They started to turn away from the course to keep their heads out of the wind. We had to keep correcting them and this slowed us down.

Suddenly a solid wall of snow hit us. This was the blizzard. A huge gust of wind nearly turned the heavy sledge over. We tightened our clothing and the dogs flopped down with their backs to the wind. They must have thought that we were going to sit out the blizzard on the ice and so had curled up to keep warm.

"I'll have to lead them," I yelled. "They won't be able to see a thing in this, but they'll pull if we stay with them."

"We'll take turns," said Peter.

I struggled up to the leading dogs, bent almost double in the wind. "Come on, lads. Mush!" I yelled.

The whole team leapt into their places and we began the last weary trek through the blizzard. I tried to keep a steady course but it was hard not to swing away, as the dogs were doing. It became more and more difficult as the blizzard's strength increased.

A shout from the rear: "Nils, keep more to your left, more into the weather."

I turned into the wind again, keeping my gloved hand over my face. Now and then I turned to look at the dogs. They were bunched together and were pulling with their heads turned away from the blast. Their coats were completely iced up, like white suits of armour. Oscar kept rubbing the ice off his face with his paw. He was the only dog who seemed to realise the danger of the blinding, choking ice. He had managed to keep himself almost free of it.

"Hold it," I yelled to Syd and Peter.

Hearing my shout, the team immediately flopped down and curled up. They were getting tired.

"We'll have to get rid of the ice around the dogs' eyes and nostrils," I called back to my companions. "It will be quicker to use bare hands," said Peter.

Soon afterwards the dogs were gratefully licking their de-iced faces and we struggled on. As I walked, I could feel a gentle touch on my knee. Looking down, I saw that old Butch had made his way alongside me. His eyes were almost closed. He had managed to keep his nose free of ice by rubbing it across the back of my knee. I bent down and patted his head. The rest of the team trotted along behind with their noses almost on the ground.

I remembered Peter's warning about the breakouts and wondered what we would do if we found ourselves on a piece of floe on its way north to the moving pack ice.

How would we react? What would we say to each other? Would we panic, scream for help into the storm or would we just pray? I looked into Peter's calm, frostbitten face as he came up to relieve me at the front. Suddenly I felt completely reassured. We would be all right.

"Put your hot little hand over that nose of yours," I told Peter. "It's starting to look like a lump of frozen putty."

"Thanks," said Peter and he took the lead while I dropped back to the rear of the sledge.

I was grateful when Syd offered me a lump of his much-treasured chocolate on my return to the sledge.

"These gusts must be over a hundred kilometres per hour," declared Syd. "Look at that sledge."

The heavy sledge with about 340 kilograms of gear on it was blown sideways like a ship under sail. Syd and I walked alongside, leaning on the sledge, trying to keep it even. Sometimes we lost sight of Peter, although he was no more than 30 metres ahead, and the lead dogs were blotted out by the wind-driven snow.

I put my mouth close to Syd's ear and shouted "At this rate it will be a close race against the dark. We must make those islands before then."

"We should be about eight kilometres from them now. We're doing pretty well, I think."

"Good. Go and give Peter a spell," I suggested.

Wearily, we trudged on, getting more and more tired.

The temperatures were not really low, but the violent wind gripped our faces and hands like icy steel bands. I could no longer feel the left side of my face. My left eye felt as if it would drop out at any moment. When I removed my glove to put my hand against my frostbitten face, the hand would lose all feeling in less than a minute.

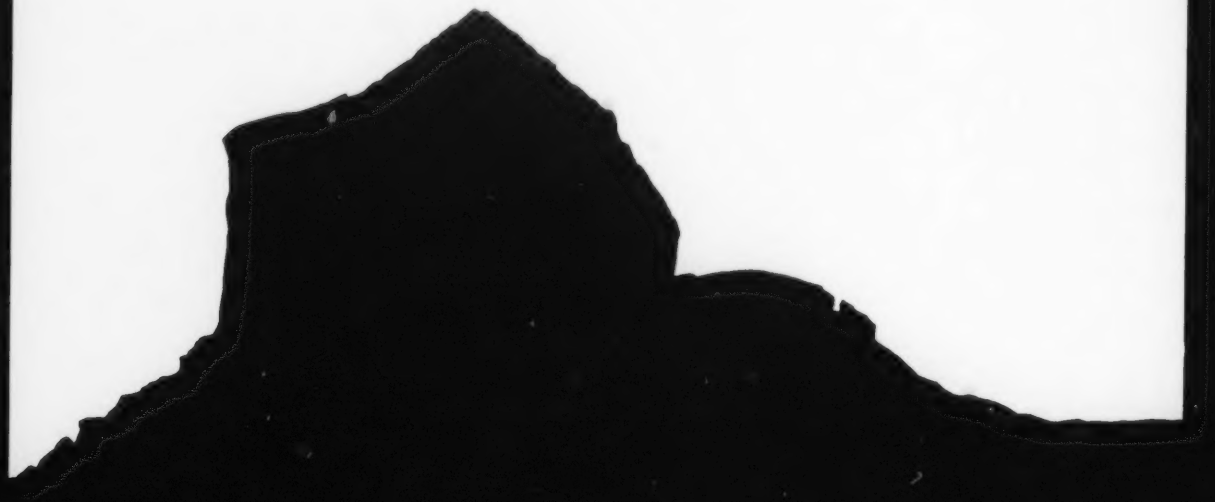
The howling wind drowned out all other sound. Each step became an effort. Perhaps we were more tired than we realised — and getting rather hungry. That is when the cold often gets the upper hand.

We spelled the dogs for the last time and, crouching behind the sledge, we had a quick snack.

"We should be nearly there," said Syd. "We can't afford another stop, though. Come on, let's go."

Again I walked ahead of the team. Faithfully the old dogs rose to each occasion. Butch regained his former position by my knee and nudged me as I patted him. He and Mac, the old leaders, seemed to be more tired than the rest. They had been breaking trail all day, often through drifts of loose, heavy snow. Both dogs were stumbling. Oscar seemed less affected. His trace was tight and his tail still curled over his back. He had kept himself free from ice.

It was hard to make anything out in the blinding snow. I could find relief for my tired eyes only by looking down at my boots as they left their faint prints on the hard-packed snow. The ice below separated us from the Antarctic Ocean by a metre or less.



Suddenly I thought I could feel a slight lull in the wind — a change of direction. I tried to peer through the swirling snow, but I could see nothing. There it was again. It was as if the big wind was pausing for breath. I stopped the team and went back to Peter and Syd.

"Did you notice anything strange just then?" I asked.

"Yes," said Syd, "the wind's getting gusty, with a few lulls."

"I think there's an island a bit to the left of us," I said. "Feels to me as if we could be behind some high island, or big iceberg, which breaks the wind."

"Must be an island somewhere here," said Peter. "Let's push on a bit and see."

A few metres ahead we came across a deep crack in the ice. It looked like a tide crack that was found near solid land. I turned and followed where it led. Suddenly I nearly walked straight into a large seal's blow-hole on the ice.

Seal hole, with Weddell seal

"This must be one of the Spjotøy Islands," I thought. "That seal-hole makes it almost certain."

We started to look intently ahead. We could not afford to go past solid land. Judging by the surge of water in that seal-hole, a breakout of the ice could take place almost any time. Then a gap in the swirling snow gave us a quick glimpse of black rock. A few more steps brought us up in front of a high, steep island.

"Boy, am I glad to see that," said Syd.

"So are we," I replied, "particularly as you are the cook."

"Don't you ever think of anything but your stomach?" grunted Syd.

We left the sledge out on the sea ice beyond the tide crack, facing into the wind. We carried all our gear ashore and up to the top, where there was a flat area for the tent. The big problem was

where to stake the dogs. Finally we decided to peg them out along the narrow ice foot running right round the island. The ice foot is normally safe, but we would have to keep a constant watch in case there was a major breakout.

"It's a risk, but we must take it," I said. "Seems to me the main thing now is to secure a camp, stow our gear and have a whopping big feed."

"Hear, hear," said Peter. "Let's get cracking."

We cut steps where the rock was covered in ice, then carried all our gear to the top of the island. First we dug a square in the snow for our tent-base, then we managed to raise it in the violent wind and steady it with snow blocks. Gratefully we crawled inside and got the stove going.

"You know," said Syd, "only a damn fool would be out in this weather, let alone travelling in it."

"Well, we don't know how long the blizzard is going to last and that sea ice doesn't look too safe. If we had stayed on the Douglas Islands and waited for the weather to improve, what do you think would have happened? We would have been stuck there for the rest of the season. The aircraft may not have found us to drop supplies. We simply had to reach these islands. It wouldn't have been safe on the sea ice either. It's only about fifteen or sixteen kilometres from here to Mawson and we can hop from island to island," concluded Peter.

"I see what you mean," said Syd. "I'd hate to be stuck out on those other lumps of rock with nothing for dinner but old Butch."

After our meal, we checked the remaining supplies and agreed to ration our fuel in case the blizzard lasted for several days.

"The first break we get, we'll make a run for it," I suggested. "There is often a lull for a few hours between gusts. It won't matter what time we take off from here. The moon is full and the dogs can find their old tracks."

"OK," said Syd. "Let's get some sleep while we can."

Broken sleep

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Fully clothed, we crawled into our sleeping bags and put our boots within easy reach. Half-sitting, we dropped into an uneasy sleep.

Just before midnight, we woke to a loud crash. The guy ropes on the side of the tent had snapped and the tent was flapping in the wind like an enormous sail. Syd leapt out of his sleeping bag and was outside the tent in a moment, but he forgot to put on his boots. Peter and I grabbed a tent-pole each and held the tent down while Syd fixed the rope outside.

"Either of you blokes got a dry pair of socks?" said Syd as he came back through the entrance.

The whole thing happened again at 2am, but then the wind slackened and the snow started to come only in gusts. We could see a little more of the campsite. We were camped on the only bit of firm snow and the only flat area on the entire island. We managed to get some proper sleep during the lull, which lasted for several hours.

Then the blizzard returned in full force. We woke to the flapping of the tent and a sound like someone shovelling gravel on to the side of the tent.

I struggled into my boots, wind-proof outer clothing and black felt blizzard mask. This mask covers the entire face with small openings for eyes, nose and mouth. Finally, I pulled on two pairs of heavy, greasy-wool mittens covered with a large over-mitten of wind-proof material.

Outside, I gathered seven cakes of dog-pemmican and made my way down to the ice foot. Things had changed for the worse there. The sea ice was moving and the tide crack was a metre deep in water. Some of the ice foot had broken away. It looked like an big ice breakout was underway.

The dogs had moved as far in on the ice foot as they could. They were curled up with their backs against the wind and the spray from the tide crack. Old Butch and Mac already had a thick coating of ice across their backs. All the dogs except Oscar seemed to be asleep. He was walking back and forth, growling every time the spray hit him.

Tents are the only source of shelter on the sea ice

"Hang on, old boy," I said to him and scrambled back up the slope.

"Afraid I need your help, you two lazybones," I yelled to the sleeping men. Their response was unrepeatable, but they both got up from the warmth and comfort of their sleeping bags. In a few moments, we were all down on the crumbling ice foot.

"It will waste too much time to take the dogs up one by one," I said, thinking as I spoke. "We'll have to drag the lot up, tied up as they are. One man in front, one in the middle and one astern."

We knocked the mooring stakes loose. I grabbed the front end of the wire next to Danny and started to climb. Syd was in the middle and Peter at the rear. The wire had to be kept tight enough to stop the dogs from trying to break away, yet loose enough to allow us to move freely when climbing.

Slowly we dragged the dogs up, using every crack and outcrop for handholds and footholds. They slipped and scrambled on the icy rocks, but the wire held them up. Finally, we reached a narrow ledge leading to the top.

We all slept through the last of the blizzard. Late in the afternoon, the wind dropped and the drifting snow came only in bursts. The short daylight time had faded into darkness and through the snow we could see the sky, where the full moon shone a band of light across the frozen sea.

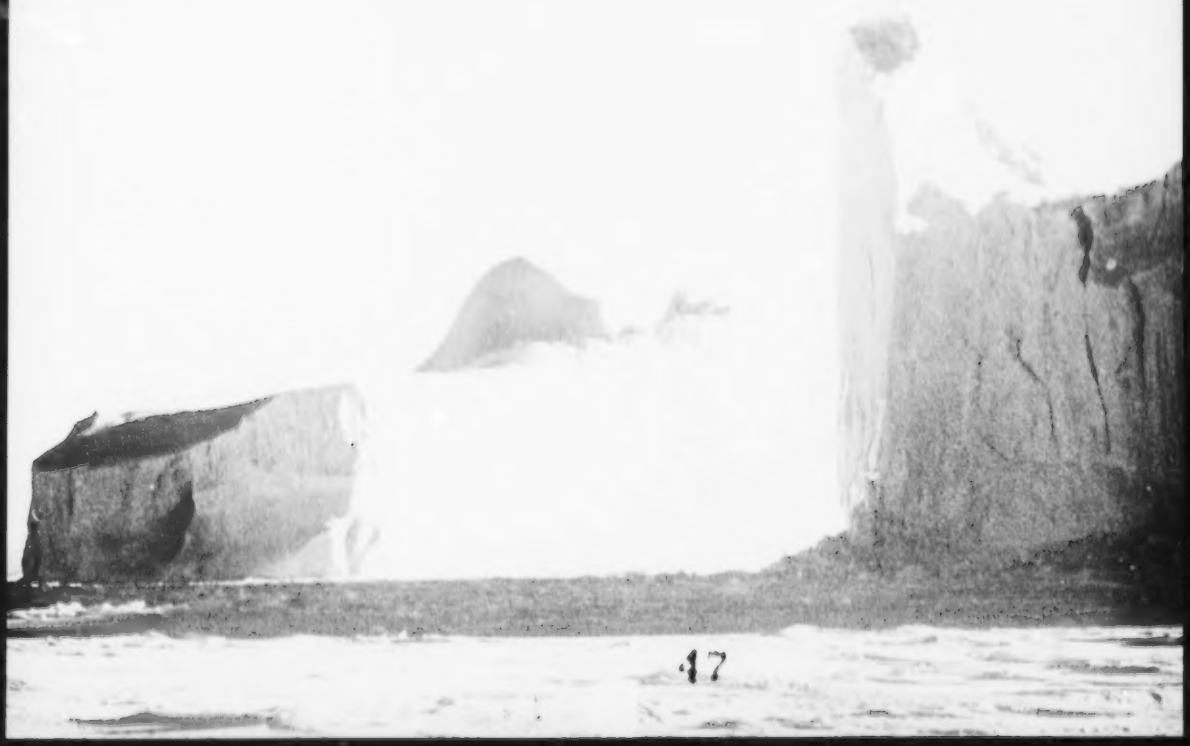
"I think it's time to make a final dash," I said. "The weather is reasonable, the moon is full and the dogs are fresh. Let's go."

Back to Mawson

Back at Mawson. At 30° c below zero, vapour from breath freezes

First of all, we took our gear back down the steep slope. We loaded the sledge once more and tied it up firmly. Then came the dogs. One by one, they were harnessed and brought down the slope. This was no easy task. The last, icy slope was the easiest, however. We sat down, placed a dog between our legs and slid down to the ice foot.

Everything went well until Syd brought Brownie down. Peter and I were already on the sea ice, waiting, when Syd sat down and forced Brownie to squat in front of him. Brownie, being a real dumbcluck, managed to get his tail under Syd's bottom. Syd was no lightweight and Brownie must have been in agony. Brownie struggled violently and Syd held on just as strongly. In a flurry of arms, legs, paws and tail, they both finished up in the tide crack. Peter grabbed Brownie and put him in his traces. I was too helpless with laughter to do anything.



Rather lightheartedly, we set off on the final run to Mawson. By now, the blizzard had died down completely. The full moon lit up an icy fairyland of towering, blue-black icebergs, dark islands and the endless mirror of frozen sea, which stretched away beyond the horizon.

We rode the sledge across the hard-packed, wind-driven waves of snow. The dogs sensed the end of their journey. Their tails were curled across their backs and all the traces were tight. I sat on top of the load and the whip trailed, unused, in the snow behind the sledge.

It was almost too easy on the run home. Island after island slid behind us in the moonlit night. The blizzard was just a memory, except for the sting of my frostbitten face. We all had touches of frostbite. Later, our faces would peel, as after bad sunburn.

Now and then, one of us would run alongside to keep warm. We were all fit from hours of sledging. I thought of the adaptability of human beings. Some city dwellers wouldn't walk two blocks and yet here people accepted the most difficult conditions.

We set off on the final run to Mawson

Stranded icebergs surrounded by sea ice

"We were lucky to stay on the sea ice," said Peter. He sat behind me. "In fact, come to think of it, we were rather lucky to find the Douglas Islands at all."

"Luck or not, we found them and that, after all, was what this little holiday was for," I replied.

"I shall take great pleasure in fixing those islands on the map once and for all," said Syd. He had joined us on the sled.

By now we were travelling close to the steep ice cliffs just east of Mawson. We were inside a string of islands. To our left, the polar plateau ended in vertical ice cliffs, split by deep crevasses from top to bottom. From the upper edge of the ice cliffs the plateau stretched for thousands of kilometres, to the South Pole and beyond.

At a full run, the dogs brought us into the harbour. We could hear the exhaust from the diesels and the excited howls from the dogs left in the camp. The huts were spread in front of us, lit by the moon and the occasional light from a window. We were home.

Mawson: we were home

Glossary

blizzard	A violent windstorm that carries dry snowflakes and is intensely cold.
black ice	Newly-formed ice over sea water. It is thin enough for the dark water to be visible through it and can be crossed only at speed by a light sledge.
breaking trail	Moving into new ground on a journey.
breakout	The summer breaking up and floating away of fast ice that has built up during winter.
chronometer	A clock or watch that keeps time very accurately.
crevasse	Cracks in the ice formed when the ice moves over uneven rocks or when floating ice spreads.
drift snow	Loose snow that has been moved by the wind and has not yet compacted.
frostbite	Inflammation of the body, especially hands, face and feet, caused by exposure to extreme cold.
frozen-in icebergs	Icebergs which have been surrounded by sea ice and trapped for the winter.
glacier	A mass of slow-moving ice formed from accumulated snowfalls.
greasy wool mittens	Special handcoverings made of untreated wool which helps insulation.
guy rope	A rope used to steady or guide something being hoisted or lowered or something liable to shift its position.
hoosh (hoosch)	A very thick soup.
ice floe	A large piece of floating ice.
ice foot	The ice that remains attached to the land after a breakout.
iceberg	A very large piece of floating ice which has broken off a glacier or the ice shelf.
pack ice	Broken pieces of floating ice which forms when storms or warmer weather melt the sea ice.

pemmican	Dried, lean meat pounded into a paste with melted fat and pressed into cakes. It originated among North American Indians and has been used for dogs and people in Antarctica.
plateau	A surface or plain of high elevation.
rafted-up icebergs	Large pieces of ice which have ridden up over each other.
sea ice	The area of frozen sea stretching out from the land.
sledge-runners	Long pieces of wood that a sledge slides on.
starfix	Observation of a star's position so that the position of the observation point can be determined accurately and located on a map.
tidal hinge, tide crack	The region where the sea ice joins the fast ice attached to the land. The ice at the junction is regularly broken because of tidal movements.
traces	The lines to which the dogs are harnessed.

Castles of Ice is one of a series of four storybooks which are part of the Pacific Circle Consortium's Antarctic Project.

Other storybooks in the series are:

Rocky the Rockhopper Penguin (8-10 years)
The tale of a brave and inquisitive rockhopper and the voyage from his Macquarie Island home across the Southern Ocean to Antarctica.

The Adventures of Salik the Husky (8-10 years)
The story of a Greenland husky pup's voyage to Antarctica and how he learns to be a sledge dog.

Oscar (10-12 years)
This true story tells of a husky named Oscar and his fight to remain "king dog" of the sledge team. He spends some time at the Melbourne Zoo and returns to spend his last days in the ice and snow.

Learning Outcomes and Activities which can be used with these modules are included in the teachers' guide. **Teaching and Learning about Antarctica**, to be published by the Curriculum Development Centre.

Sourcebooks which can be used with the storybooks are:

Penguins (10-12 years)
Background information on Penguins and case studies of three penguins - the Adelie, the emperor and the rockhopper.

Antarctica's Secrets Revealed (10-13 years)
This is in question-and-answer format, and provides a wealth of information about the Antarctic continent.

Living and Working in Antarctica (11-14 years)
Why do people brave the ice and snow to work in the harsh Antarctic environment? Here are some of the answers.

Antarctic Discovery and Exploration (10-14 years)
A look at Antarctica from the first sightings and the expeditions of the heroic era through to present day research.

Macquarie Island (11-13 years)
This Australian sub-Antarctic island is introduced with information on its animals and plants as well as on human activities.

Campbell Island (11-13 years)
Campbell Island comes under New Zealand administration and is a meteorological base. The animals and plants are described and the effects of human interference are examined.

Plants and Animals of Antarctica (11-14 years)
A filmstrip with 72 frames and an accompanying script and audio-tape.

Oceanic Birds of Antarctica (11-14 years)
Case studies of three Antarctic birds - the south polar skua, the snow petrel and the Adelie penguin

For older readers:

The Polar Continent

Seals of the Southern Ocean

Whales of the Southern Ocean

Antarctic Foodchains

The Scientist at Work

It Happened in Antarctica

From Snow to Icebergs

Ecosystems of the Southern Ocean

International Relations in Antarctica

The Geology and Mineral Resources of Antarctica

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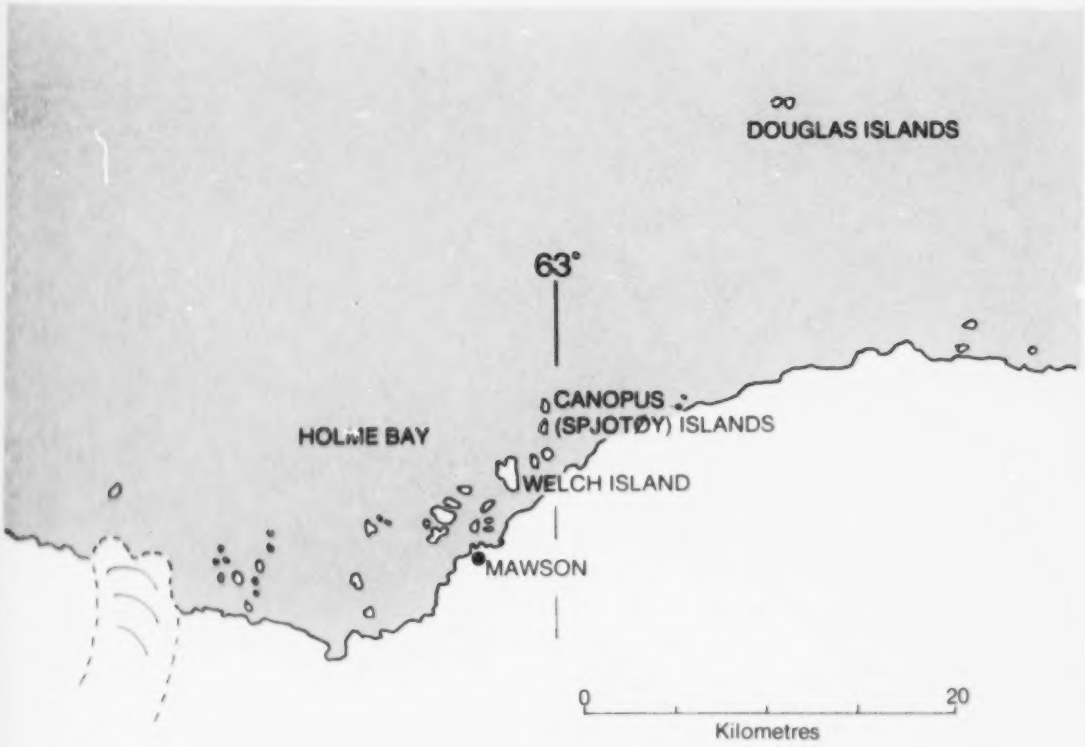
Sastrugi or wind-eroded snow — rough terrain, making surface travel difficult or impossible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